Bridge-to-Corn-Ethanol Subcontract Summary Sheet
NYSTEC
Technical Advisor: J. Sheehan

Industrial Partner: Robbins Corn Processing
Other Partners: New York State Corn Growers' Association, Raytheon Engineers and Constructors

Starch to Ethanol Process Information

Feedstock: Corn
Facility Capacity: 5MM and 29MM gallons per year
Ethanol Yield: 2.5 gallons per bushel
Other Products: Animal feed

Biomass Process Information

Size of Biomass Process: 60MM gallons per year
Ethanol Yield: NREL Base Case for Hardwood Sawdust
Feedstock: Corn Stover
Process: Co-current Dilute Acid Prehydrolysis and Enzymatic Hydrolysis
Fermentative Organism: NREL *Zymomonas mobilis*
Steam: Produced by biomass burner / turbogenerator
Electricity: Excess sold at $0.035/kwh per Niagara Mohawk quote
Other Information: Tried getting quote on purchased enzyme, but was unable to get firm price

Links with Existing Facility

None. Grassroots facility.

Capital and Operating Costs

Biomass Plant Capital Investment: $3.83 per annual gallon of capacity
Total Operating Costs: $0.79 / gal ethanol
Feedstock Cost: $30 / dry ton (plus $7.75/dry ton transportation cost)
Chemical and Disposal Cost: $0.15 per gallon

Proforma

Solved for Cumulative Profit after 20 years: $604,070
Equivalent to Average Annual Return of 0.3%
Ethanol Selling Price: $1.15 / gal
Plant Life: 20 years
Financing: 30% Equity – Loan at 11% with 15 year term
Depreciation: 15 year straight line

SensitivityAnalysis

Range of reduced capital, debt/equity ratios, ethanol prices, feedstock costs

Strengths of Subcontract

Design and Costing for Corn Stover Handling
Design and Costing of fermentors for biomass plant (Raytheon increased vessel size)
Analysis of cost and availability of biomass
Engineering Company Verification of Many Equipment Costs
Labor Requirement Calculations

Subcontract Recommendations/Next Steps

Pursue business plan for corn ethanol and track R&D for reductions in capital investment of biomass ethanol plant.